

ACCELERATED SITE TECHNOLOGY DEPLOYMENT

Technology Fact Sheet

Deployment of a Universal Demolition Processor

Fernald Environmental Management Project

In Partnership with the Office of Science and Technology

INTRODUCTION: As Decontamination and Decommissioning (D&D) work at Fernald progresses from above grade facilities to at grade and below grade facilities there will be a bona fide need for new technologies to process concrete.

Fernald can realize significant cost savings by reprocessing and reusing a portion of the site's concrete. There is a defined need for aggregate to build and strengthen the site's transportation infrastructure in and around the On-site Disposal Facility (OSDF). Project personnel in the Soils and Water Division have an estimated need for up to 15,000 cubic yards of aggregate per year, for the next six years. Not recycling the site's concrete means that tons of aggregate will have to be trucked in from off-site and subsequently disposed in the OSDF. Reprocessing a portion of the concrete saves the costs associated with the purchase of virgin aggregate and its subsequent disposal cost. The site can also realize increases in safety, efficiency and schedule by utilizing the plate shear capability of the universal processor. Fernald has numerous large, heavy steel tanks including two water towers and numerous tanks made of stainless steel.

To address the site's needs, EM's Office of Science and Technology (OST) has partnered with FEMP in an Accelerated Site Technology Deployment project with OST providing \$800,000 for this deployment. Through the activities in this project, innovative technologies will be deployed to accelerate demolition/recycling of construction materials for road construction, and for segmenting large, hard to cut, plate steel and tanks. Overall decommissioning life-cycle costs are expected to be significantly lowered via the deployment of these technologies.

TECHNICAL NEED: At Fernald, there is an estimated 239,000 cubic yards of concrete in slabs, foundations, footers, and other structures that will need to be demolished and dispositioned during remediation. Site policy dictates that all of the concrete will be disposed in

the OSDF; however, concrete, like other debris, must meet exact size criteria before placement. Concrete pads and other structures will be readily processed for reuse or efficient disposal via deployment of a universal demolition processor. Deployment of the universal processor will satisfy site technology need #F047.

SYSTEM DESCRIPTION: The universal demolition



Pulverizer (above),
Cracker (left) and
Plate Shear (below)



processor is essentially three different technologies in one. The universal processor, via exchanging jaw sets, can be a concrete pulverizer, concrete cracker, or a shear capable of cutting up thick plate steel.

The concrete pulverizer is designed to demolish and process concrete buildings, slabs, foundations and other concrete structures, separating the reinforcing steel bar from the concrete, leaving valuable, reusable aggregate.

The concrete cracker technology is designed to cut and remove concrete sections, with the reinforcing bar intact, for either future pulverization or direct placement into the site's OSDF.

The plate shear is specifically designed to segment thick steel plate that is found in many tanks at Fernald and across the complex safely, efficiently, and cost effectively

The universal demolition processor will be attached to the track-mounted carrier—a previously deployed Accelerated Site Technology



Deployment (ASTD) technology (OST #2303) used for structural steel segmentation and other demolition operations.

BENEFITS:

- Enhances safety because it moves workers away from demolition activities (tank segmentation, etc.) and use of the shear is faster than a cutting torch for numerous reasons including the fact that lead paint does not have to be removed prior to shearing.

- Fulfills recycling, reusing and waste reduction objectives.
- Estimated unit cost savings of \$55/cubic yard by deploying the Universal Demolition Processor to recycle 8,400 cubic yards of concrete per year. (Estimate is based upon a life-cycle cost estimate prepared by Fernald's Estimating Services and incorporates all relevant variables such as labor rates, technology production rates, OSDF disposal costs, cost to purchase aggregate, maintenance, and the cost of separating reinforcing bar
- Estimated total cost savings of \$2.8 million (ROI of ~3.5) over the next six years by using recycled concrete instead of purchasing, and subsequently disposing of 50,000 cubic yards of aggregate.

STATUS: FEMP's proposal to deploy the Universal Demolition Processor was selected for award in Spring 2000. The project was fully funded at the \$800k level in the May Financial Plan. The steps necessary to successfully implement and deploy the universal processor are as follows:

- Establish project control accounts (to be completed in August 2000);
- Universal processor procurement (initiate in mid-August 2000);
- Prepare and issue task orders for removal of concrete foundations and footers for previously demolished buildings and structures, and prepare work, health, and safety plans and D&D engineering specs (begin in September 2000);
- Prepare waste management plan (mid-Sept. 2000);
- Mobilize Universal Demolition Processor for D&D of concrete foundations and footers for previously demolished buildings & structures (by end of 2000);
- D&D of concrete foundations and footers for previously demolished buildings and structures (early Spring 2001);
- Demobilize (Spring 2001);
- Prepare Cost and Performance Report (Summer 2001).

For more information about the deployment of the Universal Demolition Processor at the Fernald Environmental Management Project Site, contact:

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